THE COMPUTER AS SUPER-TYPEWRITER

Of the many applications that make computers virtually indispensable in the workplace, word-processing is the one most likely to find ready uses at home as well. If your family often uses a typewriter, word-processing can replace it, just as word-processing has in many offices.

A word-processor is to a typewriter as a typewriter is to a fountain pen. With a word-processor, the words you type appear on a video display rather than on a sheet of paper. You can then correct the words, delete them, rewrite them, and move them singly or in blocks from one place to another, all with a minimum of retyping. When satisfied with what you have written, you can format your words electronically in a way suitable for a letter, a book report, a business report, or a manuscript of The Great American Novel. That done, a printer, controlled by the word-processing program, puts the words on paper at great speed, in the form you've laid out.

The computer owners who responded to a CU survey last year described word-processing as the most important functional use of a computer.

Word-processing is also the computer application that requires the greatest investment in hardware. Set up for word-processing, an inexpensive computer such as the *TRS-80 Color Computer* would cost $700 or more. (See "Computers: Should You Take One Into Your Home?", CONSUMER REPORTS, September 1983.) Word-processing with the *Apple IIe* would cost closer to $2500.

For a variety of reasons discussed in last month's report on computer hardware, the relatively inexpensive "learning" computers intended for use with a TV set are not well adapted to word-processing, although word-processing is possible with any of them. Only 40 percent of our survey respondents who owned such computers used them for word-processing, compared with 75 percent of those with more elaborate systems.

A computer system for word-processing would typically include a central processing unit (CPU) with at least 48K of random-access memory (RAM); 64K is better yet. It would also include a disk drive (preferably two), a monitor, and a printer.

Then there's the word-processing program itself. That's the subject of this report.

There are probably 100 or more word-processing programs on the market. Once you select a computer, however, the choice narrows. With inexpensive computers, the choice narrows to two or three programs each. With costlier systems, such as the *Apple IIe* and the *IBM-PC* and their clones, you can choose from among a dozen or more readily available programs. The choice is greater still for computers that use the business-oriented CP/M disk operating system.

Most word-processing programs are on disks priced at $100 to $500 or more. There are also a few programs on cartridges, cassette tapes, or disks priced from $40 to $100.

A relatively modest program might be all you need for letters or school reports. A costly program would contain more functions than you're likely to use at home and could introduce a discouraging complexity to what can be a surprisingly easy task.

For this report, we looked at 11 of the most widely sold programs. Our small sample includes at least one program for each of the computer systems most likely to be bought for home use and covers the whole range of price and complexity. We did not rate the programs. A $40 cartridge for the *TRS-80 Color Computer* is hardly comparable to a $500 program for a free-lance writer. While you might well wind up buying one of the programs we tested, don't limit your shopping to this small group. Rather, use this report as an introduction to what word-processing programs do, and as an aid in evaluating other programs.

The individual discussions of the tested programs beginning on page 547 highlight operating conveniences and inconveniences that you can watch for while trying out programs we haven't tested. As a further aid, the table on pages 544 and 545 can be used as a sort of worksheet for evaluating other programs: The "comparison program" column in the table is there for you to list the features of programs you're considering.

The key routines

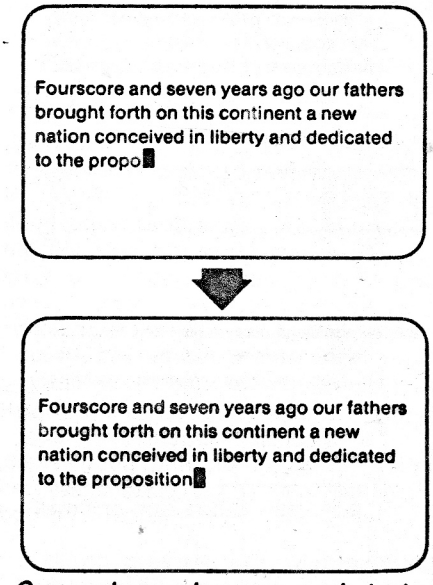
A word-processing program is a collection of "routines." You can look at routines the way you look at the features of an automobile: Some are essential, some are inessential but convenient, and some are necessary only for special purposes.

The most extensive word-processing programs include routines that allow skilled operators to produce and print complicated reports that meld text with columns of figures or scientific notations, or to merge addresses with form letters to produce large mailings. Our discussion, however, concentrates on routines that are essential or convenient for home use rather than on special-purpose routines.

Writing and editing

The most important routines are the ones that let you rapidly type your document and correct it. These include:

Cursor controls. The cursor is a patch of light that tells you where you are on the screen. Usually, it travels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Cursor shows where you are in text.

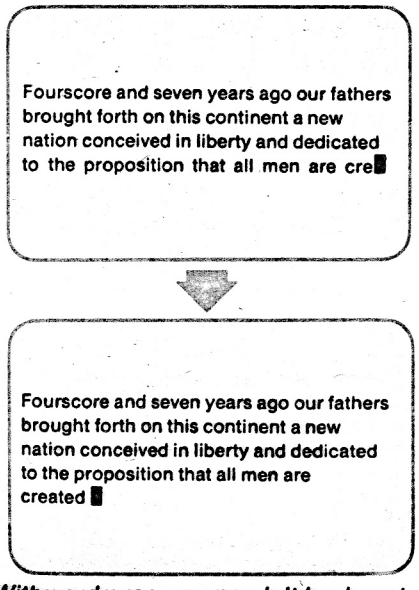
along as you enter text, trailing letters on the screen as you type them. If you want to change what you've typed, you move the cursor through the text to the place where you want to make the change.

The simplest cursor controls move the cursor one letter at a time, forward or backward as you enter the commands. That gets the job done, but slowly. An additional routine moves the cursor continually as long as you hold the key down. Speedier yet are routines that allow you to move the cursor by word, by line, by paragraph, and by screenful, or "page." An especially useful routine lets you jump the cursor to the beginning or end of the document in one step.

How you move the cursor is also important. The handiest method combines the use of four "arrow keys" (pointing up, down, left, and right to show the direction you want the cursor to go) with the use of command keys to control the distance of jumps.

Many computer keyboards lack the arrow keys or provide only one or two. Also, a given word-processing program may not activate the arrow keys to cursor-control duty. In those cases, the program must be able to shift the keyboard into a cursor-control mode in which ordinary letter keys take over the arrow-key function. Depending on the program, this arrangement may work fairly smoothly and naturally, or it may work awkwardly.

Word wrap. Word-processing programs do not, as a rule, require you to hit a "return" key each time you reach the end of a line on the screen. In the crudest programs, a word that's too long to fit on the end of a line will be broken off in mid-word and finished on the next line. In most programs, though, "word wrap" automatically takes the whole word to the next line, eliminating hard-to-read fragments of a word at the line end.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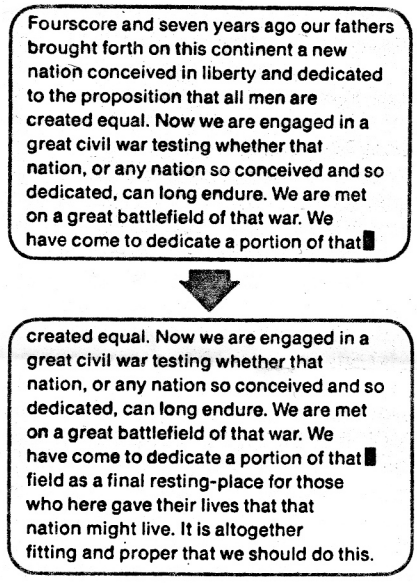
Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition that all men are created

With word wrap, you needn't hyphenate.

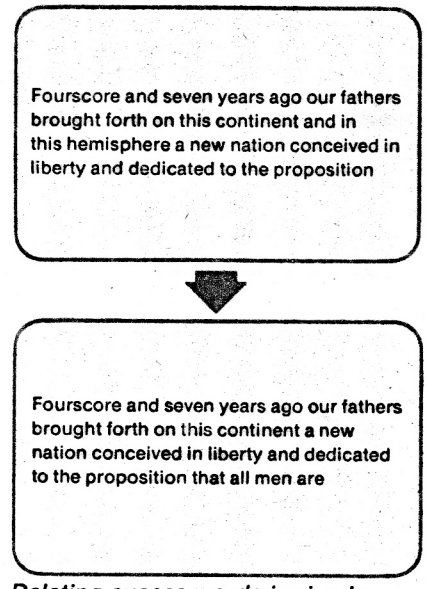
When you want to jump to the next line rather than fill a line to the end of the screen (as in lists, letter salutations, or the last lines of paragraphs), you use the "Return" key or one with a similar function on the keyboard.

Scrolling. When you try to move the cursor up or down past the lines in the document that show on the screen, the screen should adjust so that additional lines appear. That way, you can read through a document even though it's too long to fit on the screen. If you work with long documents, it's handy to be able to scroll at high speed or in page-length jumps. Another useful routine allows you to scroll the screen independently of the cursor.


Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that
created equal. Now we are engaged in a great civil war testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field as a final resting-place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

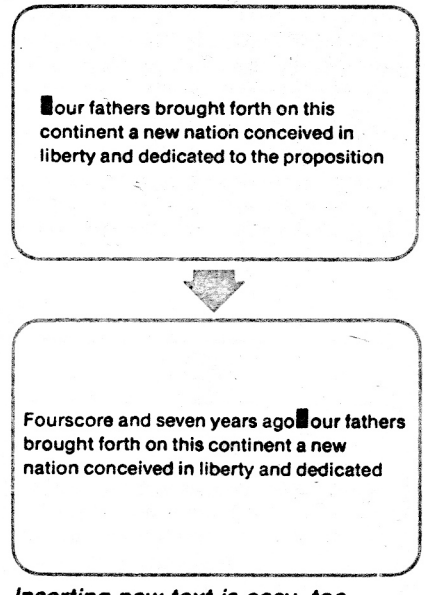
You can scroll screen up and down to read more than one screenful of text.

Deletion. You should be able to delete text by letter, by word, by line, or by larger blocks. A very handy routine allows you to delete a block of text of any length that has been marked off by the cursor. Some programs let you delete in only one direction, forward or backward; it's better to be able to go both ways. It's also better if the program highlights exactly what's being deleted before the words actually disappear, so that you can catch yourself before going too far. A few programs automatically store the most recently deleted text in memory so that you can retrieve it if you change your mind.


Fourscore and seven years ago our fathers brought forth on this continent and in this hemisphere a new nation conceived in liberty and dedicated to the proposition
Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition that all men are

Deleting excess words is simple.

Insertion. A program can offer several means of making insertions in the middle of text. To correct a typing error, it's nice to be able to type the proper spelling directly over the garbled one, so the right letters replace the wrong ones. Similarly, it's easiest to insert new language in the middle of text simply by typing it there while the rest of the text automatically adjusts to any change in the length of the document. Some programs make you first insert a blank line and type the words into it; then you may have to reformat the paragraph so that all lines are the proper length.


our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition
Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated

Inserting new text is easy, too.

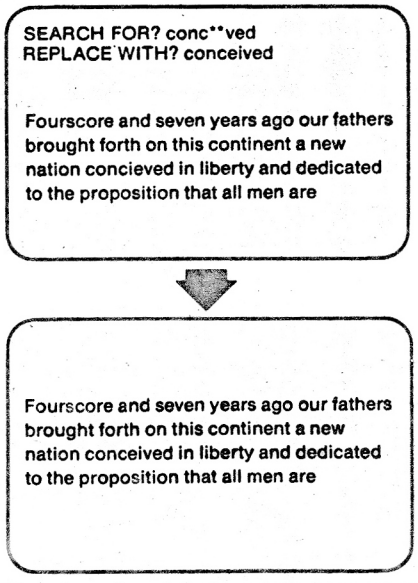
Block movements. Manipulating text letter by letter is too slow when large blocks of text are involved. Most

programs allow you to define a block of text by marking the beginning and the end with the cursor. Then you can manipulate the entire block at once.

The usual options are: *Block Move*—to move the entire block from one location in the text to another. *Block Copy*—to make a duplicate of the block somewhere else in the text. *Block Delete*—to erase the entire block from the document. *Block Save*—to save the block on disk or tape for later use in the same or another document.

Search and replace. Almost all word-processing programs have a search routine that allows you to type a word and order the computer to search for each occurrence of the word in the document. Most will also allow you to type in a substitute word that will automatically replace the original. This routine is useful for checking a word you think you've misspelled or to corroborate the spelling of an unusual name. Some writers use the search-and-replace routine as a load-lightening tool when typing a document that has many repetitions of the same long word or series of words. For instance, you can type "GW" all through a report, then at the end order the computer to replace every "GW" with "George Washington."

Some programs will automatically make the substitution every place the original word appears in the document. Others will go through the document showing you each instance, and, in effect, ask you if you want the substitution made in each case; you must command each substitution. Some programs will overlook capital letters and find the word whether it starts with a capital letter or not; others will treat capitalized words as separate words requiring a separate search. A few programs don't even require that you know how to spell the word to be searched; they allow you to substitute a symbol such as an asterisk for the letters you are unsure of. Thus, a search for "eve*" would turn up all samples of "ever" and "even."


SEARCH FOR? conc**ved
REPLACE WITH? conceived
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Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition that all men are

Search and replace can help you catch and correct misspelled words.

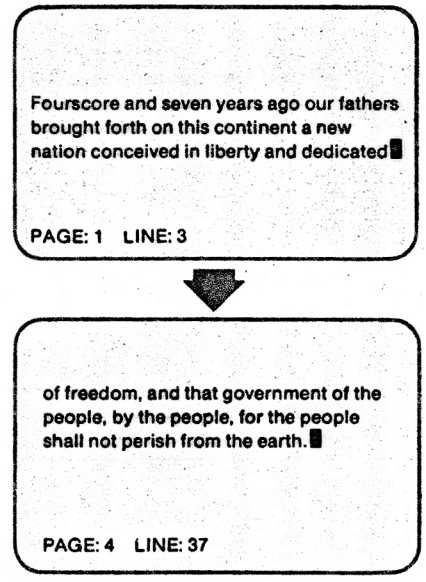
Save and re-enter. When typing a long document into a word-processor, it's good practice to "save" what you have typed every page or so by storing the material from the computer's temporary memory (RAM) onto a disk or tape. That's a precaution against accidentally losing everything you've typed—as a result of a power outage or an error you make while operating the computer. To encourage this practice, most programs have a "save" routine that is quick and easy to use. Some programs, though, make it perversely difficult to save work in progress. The *Word Handler* program, for instance, assumes you have finished work when you make a save and kicks the document out of memory after the save. To continue, you must call the document back to memory and find your way to where you were in it. That nuisance is compounded on a long document because the program does not allow you to move the cursor directly from the beginning to the end of the document; you must electronically go from page to page.

Screen formatting

A second important group of routines controls the way your work is displayed on the screen as you type it.

Capitals and lower case. Some computers produce only capital letters on the screen, even though they can drive a printer to print both upper and lower case. The *Apple II* and *II Plus* computers, in their natural, unmodified state, are notable examples. The shift key works only for numbers and punctuation marks, not for letters. To mark letters that you want the printer to capitalize, you must use the "Escape" key. (The latest version of the *Apple II*, called the *Apple IIe*, does produce upper- and lower-case letters.)

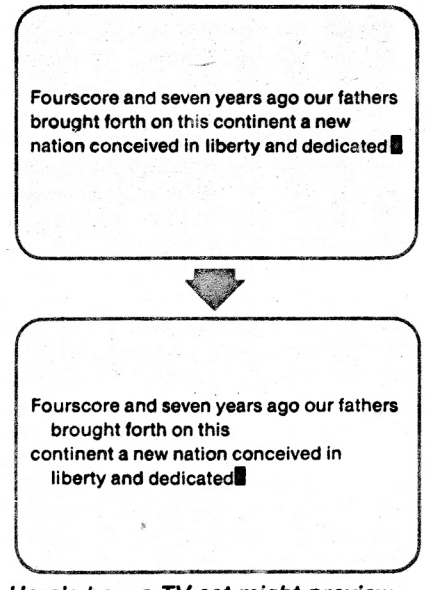
Document length. Since only a small part of a long document can appear on the screen at one time, it's easy to become uncertain about how long the document has become. Some programs help you by displaying line numbers somewhere on the screen.


Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated
PAGE: 1 LINE: 3
of freedom, and that government of the people, by the people, for the people shall not perish from the earth.
PAGE: 4 LINE: 37

Display can show length of document in pages and lines.

Others may display page numbers so you can see on which page the words will show up when the document is printed out. A few programs give other useful indicators, such as how much space is left in the computer memory or how many words the document contains.

Line length. Although most computers will drive printers to produce any convenient line length, some are limited in the length of the line they display. Most computers that use a television set instead of a monitor have the severest limitations. They produce a maximum of 40 columns (characters and spaces) on a line, and many pro-


Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated
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Here's how a TV set might preview a long printed line.

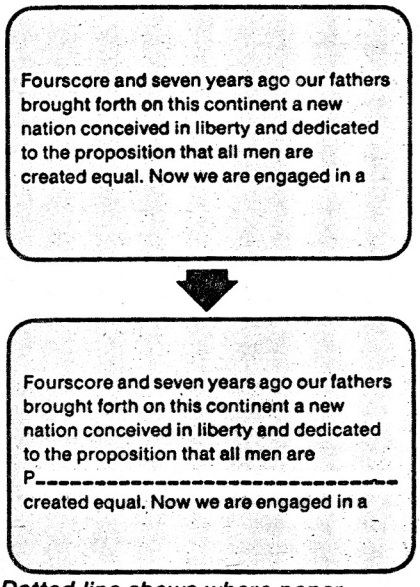
duce fewer. That's a special drawback if you want to see how the document will look when printed with a normal line length of 60 to 70 characters.

Different programs take different approaches to the problem. With some, you can set a line length longer than will fit on the screen, and the runover will appear as a separate short line. With others, the computer will scroll sideways when it comes to the overage. That makes the screen awkward to read, since you don't see a whole line at once. The least expensive programs generally don't try to give you a preview of the printout.

Tab settings. If a program permits setting tabs, and most do, the procedure is typically similar to that used with a typewriter. The only differences may be in which keys you use to set the tabs and which ones you use to operate the tab.

Some advanced programs have tab capabilities not present on a typewriter. You may be able to make the columns automatically line up along decimal points, for instance, or on the last digit instead of the first digit. Or you may be able to produce columns of words that automatically center on the tab. On the other hand, some programs are more limited than a typewriter in tabbing, permitting tab settings only in fixed places.

Displayed page breaks. It is important for the screen to show you where page breaks will occur when the text is printed. You would not, for example, want the last word of a paragraph to appear alone on the first line of a new page. A few programs indicate page breaks on the screen and let you force a different page break on the printer, if necessary, to keep material on the page where you want it.


Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition that all men are created equal. Now we are engaged in a
Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition that all men are
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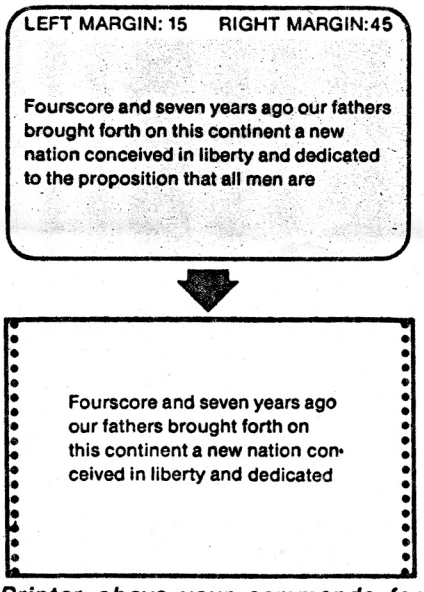
created equal. Now we are engaged in a

Dotted line shows where paper page would end.

Print formatting

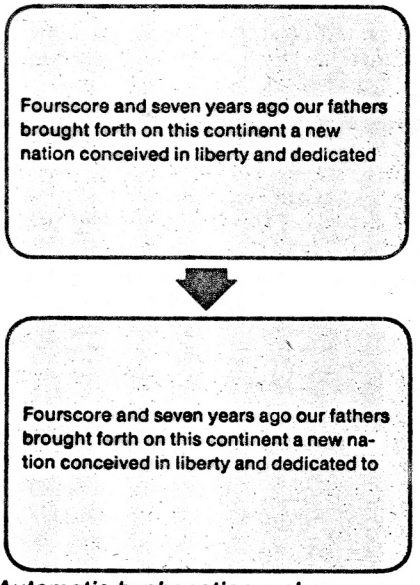
A third group of routines allows you to change the appearance of the displayed material before you print, and provides options for the layout of the print on paper.

Margin settings. To control the format of the printed output, you should be able to specify the margin settings you want on all four sides of the page. Several programs lack that ability on one or more sides. Normally, programs that offer complete flexibility also have "default settings"—settings the program will specify when not instructed to do otherwise. The default settings are normally appropriate for business letters on 8½x11-inch paper. Many programs also let you reset the default settings, so you needn't reset programmed margins for the sort of document you produce most of the time.


LEFT MARGIN: 15 RIGHT MARGIN:45
Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to the proposition that all men are
Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated

Printer obeys your commands for margin settings.

Hyphenation. Word wrap eliminates the need to hyphenate a long word that doesn't fit at the end of a line, but occasions may arise when you want to hyphenate. Suppose, for example, that a very long word missed fitting by only one or two letters; word wrap would move the whole word to the next line and leave you with unattractive spacing on the line above. By typing a hyphen and a space, you can fool the computer into thinking it was dealing with two words. But if subsequent editing moved the word away from the end of the line, the computer would stay fooled—the hyphen and space would remain, inappropriately, in the middle of the line.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Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated to

Automatic hyphenation makes tighter lines.

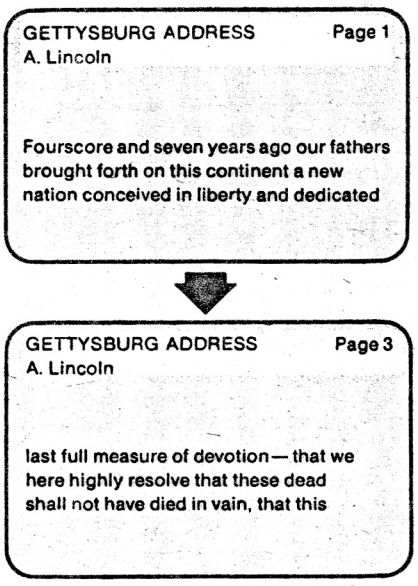
Some programs get around this awkwardness by offering "soft hyphens"—hyphens that disappear if the word's place shifts from the end of a line during further editing.

(As you shop for word-processing programs, you will encounter some that offer the option of automatic hyphenation in place of word wrap. The computer will follow general rules of hyphenation, and may be backed up by a "hyphenation dictionary" of words with uncommon hyphenation. The hyphenation may occur while you type the document, or you may have to run a separate routine to hyphenate and tighten up an otherwise finished document. Either way, a few mistakes are bound to occur, so you must always read the printed document with that in mind and go back to make any necessary corrections.)

Automatic pagination. Many, but not all, programs will automatically number the printed pages for you on the printout. Most will also allow you to omit the number on page one, where it might interfere with the appearance of the title or salutation. Some also let you designate the position of the page number—top, bottom, left, center, or right.

Headings and footings. When producing long documents, it often helps to print the title or chapter heading at the top of each page. Many programs

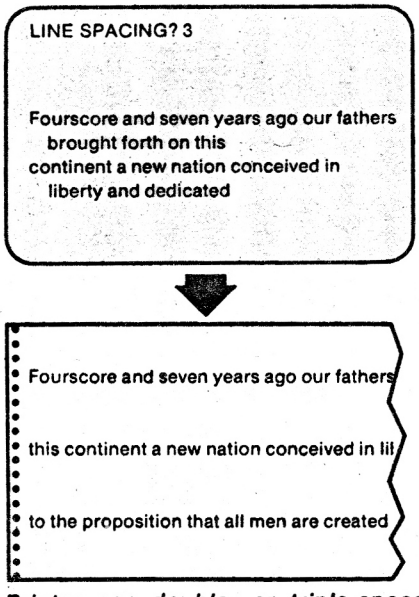
Text continued on page 546


GETTYSBURG ADDRESS Page 1
A. Lincoln
Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated
GETTYSBURG ADDRESS Page 3
A. Lincoln
last full measure of devotion— that we here highly resolve that these dead shall not have died in vain, that this

Headings can be inserted automatically.

will let you do that automatically. Some will let you put it at the top or the bottom of the page, and a few will let you use two-line headings or footings.

Line spacing. All word-processing programs can produce single-spaced documents. Many will allow double- or


LINE SPACING? 3
Fourscore and seven years ago our fathers brought forth on this continent a new nation conceived in liberty and dedicated
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this continent a new nation conceived in lil
to the proposition that all men are created

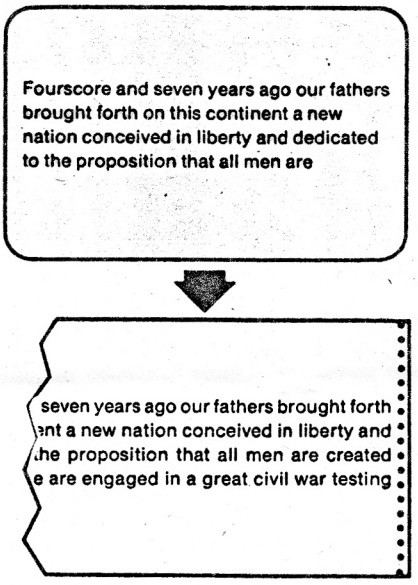
Printer can double- or triple-space text typed with single spacing.

triple-spacing if you choose. A very few permit even greater flexibility.

Centering. One of the pleasant tricks that most programs can do is to center a word or a title on the line at the press of a key or two. No more need to count out the letters in a title, divide by two, and backspace from the centerline.

Justified margins. You can make a document look distinctive by "justifying" both margins of the typed lines—creating a right margin as smooth and straight as the left. Books, magazines, and newspapers are normally printed that way, while typed manuscripts have a "ragged" right margin.

Most programs offer a routine for justifying the right margin. Typically, the computer will insert additional space between words until the line matches the length of all the others. A more advanced method uses what is called incremental spacing or microspacing. With this method, small spaces are inserted between letters,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"Justified" margins square off a "ragged right" document.

as well as between words, to fill out a line. Incremental spacing avoids the overlarge spaces between words that can sometimes occur with justified right margins.

Note that not all printers are capable of incremental spacing; if you want this nicety, make sure that the printer you buy can produce it—and that the word-processing program can drive that particular printer.

Print pause. Printing a long document is easiest using fanfold paper—paper in which the sheets are joined head-to-foot with perforated lines. Then the printer can go from page to page in one continuous operation. When single sheets are used, the printer must pause at the end of each page so you can change the paper. If you expect to use both types of paper, you need a word-processor that can run the printer either way.

Character enhancements. This is compuspeak for printing out underlines, boldface, and other typographical devices.

Underlining is one of the most commonly available character enhancements. To print underlined words, you must insert into the text the commands that will invoke the special efforts by the printer. Few programs will reproduce the underlining on the screen. But there's always some indication on the screen to show which characters will be underlined when the document is printed.

Bold-facing and double-striking are other techniques used to emphasize printed words. These options order the printer to produce type that looks **something like this.**

Technical material often calls for subscripts (as in H_2O) and superscripts (as in $E = mc^2$). A number of programs have routines that produce one or both of these. As with underlining and bold-facing, you have to make sure that the program, computer, and printer can all work together to produce these enhancements.

Operation aids

When evaluating any software program, it's important to consider not only what the program can do but how "friendly" it is—how much help it provides the nonexpert user. Help takes the following forms:

Help menu. Since it takes a while to become proficient with all the computer commands in a word-processing program, many programmers try to help the beginner by making the operation "menu driven." The screen displays a list, or menu, of the program's commands. Then you strike the key or keys that the menu gives for the command. That's fine for the beginner. But the menu takes up screen space better devoted to the words you're typing; and calling up successive menus (there's usually more than one) can slow things down. Some programs make the menus optional: You use them only when you've forgotten a command. That's a better approach than fixed menus. Without menus, you have to look up commands in the printed reference matter.

Reference card. If the various commands of the word-processor are written down in an abbreviated form on a card, you can keep the card nearby as a quick reference. That beats looking up commands in a manual.

Tutorial. For the first-time user, a step-by-step teaching approach is a good way to learn the commands that

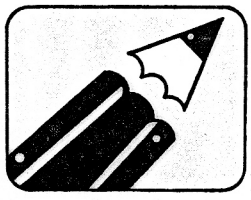
operate the program's routines. A written tutorial augmented by a special program on the screen can make learning virtually painless.

Manual. Instruction manuals usually have two parts: operation and reference. The operation section introduces the word-processing program, describes what equipment is needed to run it, how to start it, and basic operation. The reference section simply lists the command codes and what results they produce. People experienced with one word-processing program can usually go directly to the reference section to learn a new one. Neophytes should start by reading the operation manual and then using the tutorial.

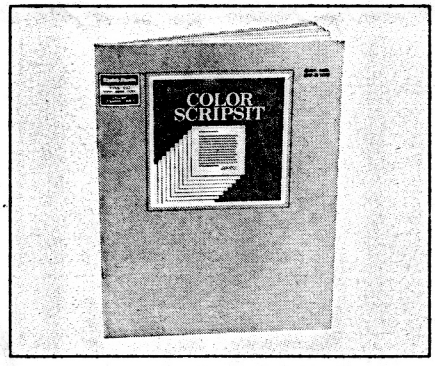
Recommendations

The table on pages 544 and 545 details which of the routines described above are available in the word-processing programs that we evaluated. In the discussion of those programs that follows, we describe how well the routines actually work. Remember, however, that we tested a relatively small sampling, mainly to illustrate the range of choice on the market.

If word-processing is a significant reason for you to consider the heavy investment in computer hardware required, try to have a dealer (or several dealers) demonstrate the programs compatible with the hardware you are considering. Use the table and the text discussions only as a standard of comparision. Make sure the program you are considering has the routines you need for convenient functions. But don't insist on every nicety possible, unless you are willing to spend hundreds of dollars extra for a program designed for the more-complex demands of an office than for typical home use. ■



WORD-PROCESSING PROGRAMS



COLOR SCRIPSIT, $40

Tandy Radio Shack
1500 One Tandy Center
Fort Worth, Tex. 76012
Available for: TRS-80 Color Computer (cartridge).
System requirements: 4K RAM, cassette-tape player.

You can't expect too much from a word-processing program that comes in a $40 cartridge, so it's a surprise to find out how much actually is available in *Color Scripsit.*

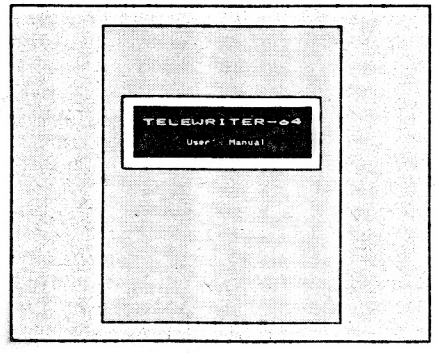
Writing. You can move, copy, or delete blocks. Text can be saved on cassette tape at any time without leaving the program. The program has word wrap and will even hyphenate. And all of this is fairly simple to operate. For several commands, the "Break" key is used like a "Control" key; for others, the "Clear" and "Shift" keys are used in conjunction with the arrow keys.

Editing. The four keyboard arrow keys move the cursor up, down, left and right, and the cursor can be sent directly to the beginning or end of a document. You can delete by character or by word. And you can insert and search-and-replace.

Screen formatting. The *TRS-80 Color Computer's* screen display is limited to 32-column lines and lacks lower-case letters. The screen will scroll sideways for a line longer than 32 columns, but the publisher recommends setting the line length at 32 columns and reformatting later for the printout. We found that to be the best technique for all computer systems displaying fewer than 64 columns to a line. For printing, line length can be set at anywhere from 32 to 132 columns. Capital letters are entered using the "Shift" key, and are displayed in reversed colors.

Print formatting. The printing instructions for margins, line spacing, lines per page, and initial page number can be changed from the built-in default values. The program is designed to be used with *Radio Shack's* own low-cost printer.

The *Color Scripsit* program makes a good, inexpensive introduction to word-processing—a nice package for simple home tasks, especially letter-writing.



TELEWRITER 64, $50

Cognitec
704 Nob Ave.
Del Mar, Calif. 92014
Available for: TRS-80 Color Computer (cassette or disk).
System requirements: 16K RAM, cassette-tape player or one disk drive.

This program is designed exclusively for the *TRS-80 Color Computer.* We tested the cassette-tape version. The disk version is $60. The instruction manual includes a tutorial and a reference section, both of which are very thorough, and a reference card.

Although the *Color Computer* normally displays only upper-case letters and only 32 columns, *Telewriter 64* uses the computer's graphics capabilities to create its own character set: upper- and lower-case letters, in either a normal or a narrow width, and displays of 51, 64, or 85 columns. The narrow letters are intended for the wider displays, but the two sets can be switched back and forth at will for best readability.

Writing. The program has many of the desired characteristics for serious home use. Arrow keys move the cursor up, down, left, or right. Most commands use the "Clear" key as a control key.

Editing. One drawback to the *Telewriter 64* is the considerable memory space it requires. Using the program with a 16K *Color Computer* would leave room for only about 500 words of text—enough for a letter, perhaps, but not for most other writing. A longer document would have to be saved as a series of separate files; that's an inconvenience. However, several files can be printed out one after the other, as if they were one file. Still, that's no help in reviewing or editing a long document in its entirety. Using a *Color Computer* upgraded to 32K of memory would help overcome that inconvenience.

The cursor can be moved to the beginning or end of a document, or moved to the beginning or end of a line. The display can be scrolled forward or backward a screenful at a time. Text can be deleted by letter, line, or block. Insertions, however, can be made only by letter. Text can be reformatted at any time.

The program has the standard search operations, but if you're using search and replace, you'll have to command each replacement. Word wrap is the normal mode, and it can be turned off if desired. No hyphenation feature is offered.

Screen formatting. The display does not show line, column, or page numbers, but you can command the program to tell you how many words and lines you've written